Space Weather Forecast

Issued on Thursday, 17 November 2022 at 12:06 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Decreasing chance of Moderate flares (Minor to Moderate radio blackouts). Slight Chance of G1 (Minor Storm) from late Day 3 (19 Nov) onwards.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been at Low levels, with often frequent but low level Common-class flare activity. The largest flare was a mid-level Common-class flare at 17/0928 UTC originating from a spot group located toward the northwest limb.

There are now five numbered regions on the visible disc. Aside from the group mentioned above the other four regions are either small and magnetically simple, with one larger single uni-polar spot which is currently stable. Three are located toward the eastern limb, with the other located in the northwest quadrant.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery. A partial filament eruption in the southwest quadrant around 16/1200 UTC resulted in a slow CME. Modelling does not indicate any significant impacts at Earth.

Solar Wind / Geomagnetic Activity: The solar wind has been slow-ambient but with a slight upward trend in the most recent observations. Total magnetic field strength has been weak throughout, with the important north-south component fluctuating weakly. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain generally Low during the period. There is a diminishing chance and slight chance of both isolated M-class and X-flares through days 1 and 2, from the two recent larger and more complex sunspots as they continue to rotate away from beyond the northwest limb

Solar Wind / Geomagnetic Activity: No significant Earth-directed CMEs are expected during the period, although some minor CME effects are possible from a weak glancing pass either later on day 1 (17 Nov) or during day 2 (18 Nov).

Solar winds are currently at slow-ambient levels and expected to remain so through Days 1 and 2. An enhancement is likely from on Day 3 (19 Nov) as the large negative polarity coronal hole in the southwest disc starts to become geoeffective, with enhancement then persisting into Day 4 (20 Nov). Geomagnetic activity is forecast to be predominantly Quiet through Day 1 and into 2, with a slight chance of isolated Unsettled or Active intervals should any CME effects manifest.

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Later on Day 3 and into Day 4 Unsettled to Active levels are likely to develop with a slight chance of an isolated G1 (Minor Storm) under coronal hole influence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is most likely to persist at background levels. However, there is initially still a slight chance of a solar radiation storm emanating from the two former large and complex sunspots, now located beyond the northwest limb.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	20	10	10
Very Active	R3 to R5 X	No	10	5	1	1

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	2	1
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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